

*Citation for published version:*

Patel, M 2002, 'Consensus-based Ontology Harmonisation', 1st International Semantic Web Conference (ISWC2002), Sardinia, Italy, 9/06/02 - 12/06/02.

*Publication date:*  
2002

[Link to publication](#)

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# Consensus-based Ontology Harmonisation

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## 1 Introduction

Metadata vocabularies, which can be regarded as manifestations of ontologies, provide the critical semantics required for automated information processing. Their representation in a machine processible format is key to the realisation of the Semantic Web. However for systems to communicate in an open and meaningful manner requires some level of agreement on the concepts and terms to be used. We describe the work of the SCHEMAS project in promoting ontology convergence within domains. One major means of achieving this objective was the development of a knowledge base for metadata vocabularies, also known as a metadata registry.

Until recently, metadata element sets or vocabularies have been developed in isolation, without consideration for the wider requirements of inter-system communication. This situation poses a serious threat to the realisation of the Semantic Web, as a range of multiple and diverse vocabularies proliferate the global information space. Various levels of interoperability and integration do exist, however they are usually within tightly coupled and often closed systems. For intelligent software agents to freely roam the Web making sense of the information they find [Berners-Lee, 2001] requires some fundamental changes to how information is organised and represented. The nature of this reorganisation is under-pinned by a need for consensus and convergence. It is too much to expect this to happen at a global level, but not unreasonable for it to take place at a sectoral level, within domains of specific interest.

## 2 The SCHEMAS Approach

Several initiatives take a “top-down” approach, by defining a framework or data model as the basis on which to develop vocabularies. Although these proposals may prove useful in the construction of new vocabularies, they do not address the huge range of element sets that are already in existence. Furthermore, it will take a considerable amount of time for any such model to be widely adopted and hence emerge as a de-facto standard upon which to build interoperable vocabularies.

In contrast, the SCHEMAS project has taken a pragmatic view, preferring to take as a starting point the plethora of vocabularies currently in existence, and therefore an essentially “bottom-up” approach.

The primary function of the SCHEMAS registry is to provide a publication environment for the disclosure of customised metadata vocabularies or application profiles [Heery, 2000; Baker, 2001]. The aim is to establish an environment in which individual terms as well as whole vocabularies can be investigated for adaptations, local usages and relationships with other vocabularies.

The development of a knowledge base which can capture the landscape of current metadata vocabularies is a significant step towards the sharing and disclosure of semantics. The SCHEMAS registry provides not only a means to keep track of this rapidly changing landscape, but also helps information providers analyse patterns of usage and feed this into the alignment process for ontology harmonisation.

The bottom-up approach adopted is regarded as being complementary to the top-down view taken by other projects. Both have a role to play in the convergence of ontologies and hence work towards the realisation of the Semantic Web.

The work begun in the SCHEMAS project will continue as part of the CORES project, which began in April 2002.

## Acknowledgements

The SCHEMAS project was funded as part of the European Commission’s Information Societies Technology (IST) Programme.

UKOLN is funded by Resource: The Council for Museums, Archives & Libraries, the Joint Information Systems Committee (JISC) of the Higher and Further Education Funding Councils, as well as by project funding from the JISC and the European Union. UKOLN also receives support from the University of Bath where it is based.

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